

## Soil and Water Remediation, Groundwater/Vadose Zone (RL-0030)

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*Preparing for Appatite Barrier Installation 100-NR-2*

## Overview

This section addresses work in Project Baseline Summary RL-0030, *Soil and Waste Remediation Groundwater/Vadose Zone*.

NOTE: Unless otherwise noted, all information contained herein is as of the end of June 2005.

## Notable Accomplishments

**Well Drilling:** DOE and the regulatory agencies approved a change to Tri-Party Agreement (TPA) Milestone M-24-57 that redesignated the fifteen specific wells to be drilled in CY 2005. As of the end of June, fourteen of fifteen calendar year 2005 wells have been completed. The one well that remains to be completed is adjacent to the T Tank Farm in 200 West Area, and is expected to be completed in July. One CY 2006 TPA well that is just to the west of T Plant was initiated in June.

**Well Decommissioning:** There has been continued progress on the work to decommission wells that pose a high risk to provide a pathway for contamination to move directly to the groundwater. Work on sixty-nine of the seventy multiple-casing high-risk wells is in progress. These wells require the use of shaped explosive charges (called jet-shotting) to perforate the multiple casings and create holes that penetrate into the soil around the wells. Grout is then pumped into the wells and squeezed out into the soil to create a continuous seal inside and outside the wells. Thirty-eight of the wells are completely decommissioned. In addition, forty-four single-casing wells are being decommissioned using mechanical perforating tools that cut through the casing wall. Twenty of these wells have been worked on, and six are completely decommissioned.

**Testing a New Chromium Cleanup Technology:** Chromium contamination in groundwater in three reactor areas along the Columbia River is being addressed by pump-and-treat systems and a passive in-aquifer barrier wall. A test of a new treatment technology was initiated on June 28, 2005, three days ahead of the TPA milestone (M-016-28B). This technology, using the chemical calcium polysulfide, has been proven to be effective at other chromium cleanup sites. The chemical is added to groundwater that is pumped to the surface and it changes the valence state of chromium from the mobile, toxic +6 state to the immobile, nontoxic +3 state. It not only removes chromium at the surface but then the treated stream can be reinjected into the aquifer to treat groundwater in place. Within days of startup, chromium in the aquifer was reduced by 75 percent.

**Uranium/Technetium-99 Cleanup:** The 200-UP-1 pump-and-treat system was shut down in December 2004, because the concentrations for uranium and technetium-99 had been reduced below the remedial action objective (RAO) levels set in the CERCLA Record of Decision. A one-year monitoring study was initiated in January to determine if the levels would remain below the RAO levels or if they would "rebound" to higher levels. There was a brief rebound of uranium in one well to a level greater than the RAO. Recent data from the rebound study show a decline in the peak concentrations to levels roughly equivalent to concentrations that were in the groundwater at the time the pump-and-treat system was turned off.

**Strontium-90 Cleanup:** The radioactive isotope strontium-90 is present in the soil and groundwater beneath parts of the 100-N Area. A pump-and-treat system has been in place since the mid-1990s. The system very effectively removes the strontium-90 that can be pumped to the surface but the contaminant attaches very strongly to the soil and there are studies that indicate it could take up to more than 250 years to clean up the contamination using this approach. A number of new activities have been proposed to install treatment technologies close to the Columbia River shoreline to grab onto the strontium-90 and hold it in-place using a mineral called apatite. Preparatory work to understand how strontium-90 is being incorporated into clam shells along the shoreline was completed in June. This data is very diagnostic and is key to helping focus where the apatite barrier should be placed to be most effective as a protective measure for the Columbia River.

## FY 2005 Funds vs. Spend Forecast (\$M)

	Projected FY 2005 Funding	FY 2005 Fiscal Year Spend Forecast	Variance
Soil & Water Remediation, Groundwater/Vadose Zone	\$ 53.1	\$ 52.6	\$ 0.6

## FY 2005 Schedule/Cost Performance (\$M)

	Budgeted Cost of Work Scheduled	Budgeted Cost of Work Performed	Actual Cost of Work Performed	Schedule Variance \$	Schedule Variance %	Cost Variance \$	Cost Variance %	Budget At Completion
Soil & Water Remediation, Groundwater/ Vadose Zone	\$36.0	\$34.7	\$35.8	-\$1.3	-3.7%	-\$1.1	-3.2%	\$49.5

Numbers are rounded to the nearest \$0.1M and include the Closure Services allocation.

**Schedule Performance (-\$1.3M/-3.7%).** The unfavorable schedule variance is due to:

- Delayed award of the jet-shot and mechanical perforation decommissioning contracts.
- Technical issues in ISRM barrier drilling and delays in ISRM barrier maintenance.

The schedule associated with well decommissioning will be recovered; field work started in mid-January 2005.

**Cost Performance (-\$1.1M/-3.2%).** The unfavorable cost variance is due to:

- Under estimated impact of growth within the Project (labor, training, occupancy, vehicles, etc.) .

## Performance Analysis FYTD and Monthly (\$M)

